

Simplifying the Air Permitting Process

Exemptions

BUREAU OF AIR QUALITY
Engineering Services Division

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Disclaimer

This booklet is produced by the South Carolina Department of Health and Environmental Control (SC DHEC) - Bureau of Air Quality. The intent of this booklet is to provide a basic overview of the process to determine if equipment is eligible for a construction permit exemption.

This booklet is not a substitute for applicable Federal and South Carolina laws and regulations. South Carolina Air Pollution Control Requirements and Standards are contained in SC Regulation 61-62.



Introduction

A common question asked by businesses in the state of South Carolina is, “Do I need an air permit and what is involved in the process?” The purpose of this Exemptions Guide is to provide you with basic information on how to determine if your process qualifies for an exemption from the requirement to obtain a construction permit.

This guide will help you determine if a permit is needed or if your equipment is exempt. You may find you need additional technical assistance to identify pollutant emitting equipment or calculate emissions. Hiring a consultant experienced in handling air permit applications can further help you with the process.

What is an Air Permit?

An air permit is a legal document that details how a facility complies with state and federal air pollution regulations. Air permits may contain emission limitations, work practice standards and record keeping, monitoring, and reporting requirements.

The Bureau of Air Quality (BAQ) issues construction permits, operating permits and registration permits. This guide focuses on exemptions to construction permits.

What is a Construction Permit?

A construction permit is an air permit required for any person who plans to construct, alter, or add to a source of air pollution, including the installation of any air pollution control device. The construction permit must be issued before any construction-related activities occur at the site. These activities include, but are not limited to, an increase in production, change in raw materials, or modification to existing equipment. The construction permit allows for construction and start of operation of equipment.

What are the Regulated Air Pollutants?

Criteria pollutants: Criteria pollutants are those pollutants that are common and emitted in relatively large quantities by a variety of sources, such as vehicles and industrial activities. The Environmental Protection Agency (EPA) uses these pollutants as indicators of air quality.

- Particulate Matter (PM), PM10 (PM less than 10 micrometers in diameter), PM2.5 (PM less than 2.5 micrometers in diameter)
- Nitrogen Oxides (NOx)
- Sulfur Dioxides (SO2)
- Carbon Monoxide (CO)
- Ozone (as Volatile Organic Compounds (VOC) and NOx)
- Lead (Pb)

Hazardous Air Pollutants (HAP): Federal list of 187 pollutants that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects. (www.epa.gov/ttn/atw/pollsour.html)

Toxic Air Pollutants (TAP): SC's list of 258 pollutants (including the federal HAP list) that readily cause or may cause reversible or irreversible changes or permanent injury or death. (www.scdhec.gov/environment/baq/docs/regs/pdf/r61-62_5S8.pdf#page=2)

Greenhouse Gases (GHGs): 6 pollutants combined into one, called carbon dioxide equivalent (CO2e):

- Carbon dioxide (CO2)
- Methane (CH4)
- Nitrous oxide (N2O)
- Sulfur hexafluoride (SF6)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)

Do I Need a Construction Permit?

Step 1: Identify Equipment and Processes Emitting Air Pollutants

Prior to any on-site construction, draw a map of your facility and list all equipment to be used at the site. This includes storage areas and generators. Identify the equipment that can potentially emit air pollution. A source of air pollution can be a single piece of equipment, such as a boiler, or a process line that contains multiple pieces of equipment. Consult with the technical adviser/engineer in charge of the planned operation, the equipment manufacturer and the raw material supplier to determine if air pollutants can potentially be released.

Review the Material Safety Data Sheet (MSDS). Another good source is the Environmental Protection Agency's (EPA) AP-42 - Compilation of Air Pollutant Emission Factors clearinghouse. This clearinghouse identifies common industrial operations that emit air pollutants. Below are some examples of air pollution activities.

Common operations involving any of the following:

- Using paints, coatings, resins, solvents, adhesives or inks
- Burning fuel oil, diesel, natural gas, propane, wood, coal or other fuel
- Mixing, reacting, or packaging chemicals
- Grinding, screening, cutting, blasting, heating, burning, drying, melting, plating or otherwise processing wood, metal, rock, rubber, fabric or other material
- Transferring dry, liquid or gaseous materials
- Activities producing dust, smoke, odors or fugitives. Fugitive emissions are those emissions that often do not pass through a stack or duct before being discharged to the atmosphere

Common installed equipment:

- A stack or vent
- Paint booth, bake and burn off oven
- Printing press, storage tank or silo
- Boiler, furnace, process heater
- Reactors, condensers, mixing tanks
- Pollution control device (filter, baghouse, cyclone, scrubber, electrostatic precipitator, condenser, thermal oxidizer, etc.)

Step 2: Do I Qualify for a Source-Specific Exemption?

There are several kinds of construction permit exemptions available. In this step, you will compare your identified source(s) against the BAQ's source-specific exemption list to determine if the source(s) can be exempt.

Source-Specific Exemptions

Unless otherwise specified by Regulation 61-62.70 or any other state or federal requirement, a source's exemption status may change upon the promulgation of new regulatory requirements.

Source Description	Exemption Criteria
Boilers and Space Heaters	<p>< 1.5 million Btu/hr rated input capacity which burn only virgin liquid fuels or virgin solid fuels</p> <p>< 10 million Btu/hr rated input capacity which burn only virgin* gas fuels</p>
Comfort Air-Conditioning or Ventilation Systems	All
Motor Vehicles	All
Laboratory Hoods	All
Emergency Generators	<p>≤ 150 kilowatt (kW) rated capacity</p> <p>> 150 kW rated capacity designated for emergency use only and are operated a total of 500 hours per year or less for testing and maintenance and have a method to record the actual hours of use such as an hour meter</p>
Any Source	Emitting only the following or any physical combination of these: Steam, Air, Nitrogen, Oxygen, or Carbon Dioxide
Other Sources	<p>Air Permitting Exemptions List</p> <p>www.scdhec.gov/environment/baq/Permitting/exempt_sources.asp</p>

** Virgin Fuel means unused solid, liquid, or gaseous commercial fuel. Also, clean wood or bark that has not been processed other than for size reduction excluding clean wood or bark burned in an air curtain incinerator.*

If your source(s) meets the source-specific exemption, no construction permit is needed. Document the work used in making the exemption determination. This information should be kept at your facility site and readily available for review by DHEC personnel.

Please be aware that some exempt sources, such as boilers and emergency generators, may also be subject to federal air rules. You must comply with the requirements in these rules even if no construction permit is needed.

Visit www.epa.gov/ttn/atw/area/arearules.html for more information. You may also contact the BAQ's Air Toxics section at (803) 898-4123.

See Appendix A – Source-Specific Exemption Example

If your source does not meet the source-specific exemption, move on to the next step.

Step 3: Calculate Air Emissions

How do I calculate emissions from my planned equipment?

Potential to Emit (PTE) is defined by regulation as the maximum capacity of a source to emit a regulated air pollutant under its physical and operational design. When a facility's operation is not restricted by existing permit conditions, the PTE is the highest amount of regulated pollutants your business could release into the air when operating at full capacity for 8,760 hours a year. The PTE calculation does not take into account air pollution control devices (that comes later). Don't be alarmed if the PTE calculation shows much higher emissions than your source will emit - this is not unusual.

What is the significance of potential to emit?

Potential to emit will determine whether a facility is a "major" or a "minor" source. Because they emit more air pollution, major sources are often subject to more stringent emission limits and control requirements. More complex permits may be required. Major facilities can request permit restrictions, such as the use of control devices, to reduce emissions to minor source levels. Minor sources emit less air pollution and are thus subject to fewer air quality regulatory requirements and typically have a less complex permit than major sources.

How do I calculate potential to emit?

Step 3.1 - Identify all your emission sources

Step 3.2 - Identify all air pollutants emitted by each source

Step 3.3 - Determine the maximum amount of each pollutant emitted from each source. Assume that the equipment operates at maximum capacity every hour of the year (8,760 hours per year) with no controls.

Choose your method of emissions calculations keeping in mind that different methods are available for different types of emissions and processes. Some methods of determining emissions may be more concise or more appropriate than other methods for that particular source. It is important to use reliable and accurate data supported by documented calculations and emission factors. Common estimation methods include stack test data, manufacture/vendor data, AP-42 emission factors, mass balance, engineering judgment, etc.

Examples of how to calculate PTE can be found in Appendix B – Emission Level Exemption Example. In addition, the EPA’s “Potential to Emit – A Guide for Small Businesses” provides more detailed explanations of all the steps necessary to calculate PTE. This guide can be found at www.epa.gov/ttn/atw/1998sbapptebroc.pdf.

Once you have calculated the PTE for each pollutant for each source or single process, determine if you qualify for an emission-level exemption. Go to Step 4: Do I Qualify for an Emission-Level Exemption?

FACILITY-WIDE PTE

Step 3.4 - For each pollutant, add the maximum emissions from all production processes/equipment at the facility. Each HAP and/or TAP should be calculated separately then summed in total. Include fugitive emissions if required. This is your facility-wide PTE. This PTE will be used to determine what type of construction permit is needed if you do not qualify for an exemption.

Step 4: Do I Qualify for an Emission-Level Exemption?

The emission-level exemption applies to each stand-alone emission source (such as a boiler) or stand-alone process (such as a paint booth with bake off oven). In Step 2, you made an exemption determination based on the type of source. In this step, you determine if you are exempt based on the PTE of the source.

Emission-Level Exemptions

Unless otherwise specified by Regulation 61-62.70 or any other state or federal requirement, a source's exemption status may change upon the promulgation of new regulatory requirements.

Pollutant	Exemption Criteria
Particulates	PTE less than 1 pound per hour
Sulfur Dioxide (SO ₂)	PTE less than 1 pound per hour
Nitrogen Oxides (NO _x)	PTE less than 1 pound per hour
Carbon Monoxide (CO)	PTE less than 1 pound per hour
Volatile Organic Compounds (VOC)	PTE less than 1000 pounds per month
Fugitive Emissions	Case by Case approval from BAQ

If your source's PTE is below the exemption levels, then no construction permit is needed. For emission-level exemptions, you are required to document the work used in making the exemption determination. This includes the emission calculations and all the assumptions made in that calculation. This information should be kept at your facility site and readily available for review by DHEC personnel.

Some exempt sources, such as boilers and emergency generators, may also be subject to federal air rules. You must comply with the requirements in these rules even if no construction permit is needed.

Visit www.epa.gov/ttn/atw/area/arearules.html for more information. You may also contact the BAQ's Air Toxics section at (803) 898-4123.

See Appendix B – Emission Level Exemption Example

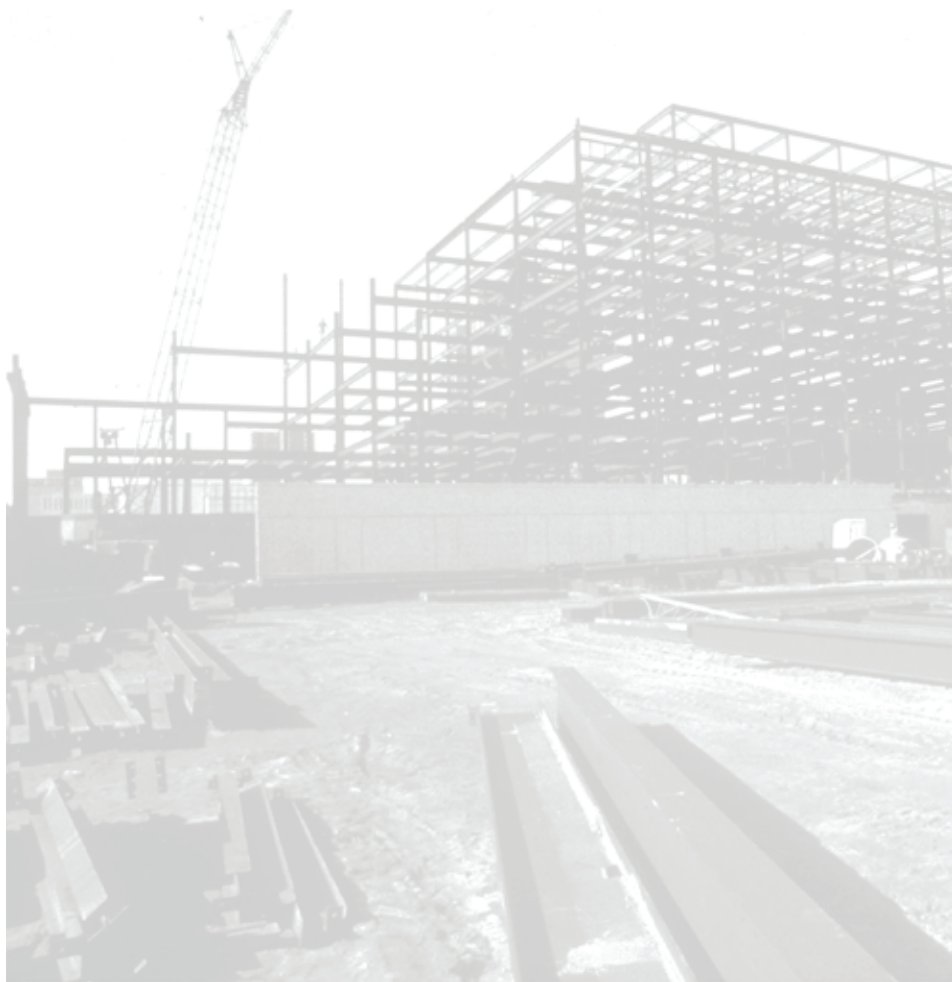
Fugitive Emissions

Fugitive emissions are emissions that can't reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. Examples of fugitive emissions are material storage piles and material handling. Fugitive emission sources may qualify for an exemption. A request must be made to the BAQ and the need for a permit will be made on a case-by-case basis. This determination will take into consideration, but will not be limited to, the nature and amount of the pollutants, location, proximity to residences and commercial establishments, etc.

Other Exemptions

Other exemptions may be allowed for minor alteration, replacement or reconstruction activities when the Department determines that the alteration or addition will not increase the quantity or alter the character of the source's emissions. These exemptions are granted on a case-by-case basis.

If your source does not meet any of the exemption criteria outlined in this booklet, you are likely to need a construction permit. Please contact the Bureau of Air Quality, Engineering Services Division at (803) 898-4123.



Appendix A – Source-Specific Exemption Example

Business XYZ assembles widgets. The process consists of punching holes into pre-fabricated material to create widgets then powder coating the widgets before shipping them out. A small boiler will be used to create steam to drive the hole puncher, pretreat the widget prior to powder coating and to heat the building. Business XYZ also plans to install an emergency generator.

Step #1 - Identify sources of air emissions

Boiler: The boiler's maximum input capacity is 2.5 Million BTU per hour (boiler plate); it will burn natural gas.

Emergency generator: The emergency generator is rated at 75 kW; it will burn low sulfur diesel and will emit air pollutants. You will have a 500 gallon diesel tank.

Powder coating operation: The powder coating operation consists of a steam pretreatment wand, powder coating booth with a high efficiency cartridge (based on manufacture's guarantee) and an electric drying oven. The process will use less than 20 tons of powder coating per year. The 20 tons of coating usage is based on the maximum number of widgets that can be produced through the hole puncher. The powder coating material contains no hazardous air pollutants per the manufacture and the MSDS. The steam pre-treatment emits no air pollutants.

Hole punching: Based on conversations with the facility engineer and material fabricator, you determined no emissions would be generated during the hole punching process.

Step #2 - Review the construction permit source exempt list

Go to www.scdhec.gov/environment/baq/Permitting/exempt_sources.asp and obtain the latest air permitting exemptions list. This list is periodically updated so it is important to use the latest version.

Boiler: Boilers less than 10 Million BTU per hour rated input capacity and burn only virgin gas fuels are exempt. Since your boiler is 2.5 Million and burns only natural gas, it is exempt.

Emergency generator: Emergency generators rated at 150 kW or less are exempt. Since your emergency generator is rated at 75 kW, it is exempt. Note that the emergency generator is exempt from getting an air construction permit but it is subject to the National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (subpart ZZZZ) go to www.epa.gov/ttn/atw/rice/ricepg.html. You must comply with all applicable requirements of that federal rule.

Fuel tank: Any size and combination of above ground storage tanks with a total storage capacity equal to or less than 3,218,418 gallons containing virgin or re-refined No.2 Fuel Oil and fuel oils similar in composition to No.2 Fuel Oil are exempt. Since your diesel fuel tank is 500 gallons, it is exempt.

Powder coating operation: Stand alone powder coating operations equipped with highly efficient cartridge, cyclone or combination cartridge-cyclone collection systems to separate powder from air, or other type of process equipment designed to effectively control particulate matter, and use electric heated ovens and apply less than 100 tons per year (tpy) of powder coatings are exempt. The proposed powder coating operation fits this exemption since it equipped with the appropriate cartridge, has an electric heated oven and uses less than 100 tons of powder coatings each year.

After careful review of all facility operations, consultation with facility engineer and parts manufacturers, review of vendor information and MSDS, and reviewing the exempt list, the facility determined an air construction permit was not needed. This information should be kept at your facility site and readily available for review by DHEC personnel.

Appendix B – Emission-Level Exemption Example

Business 123 assembles and stains wood cabinets outdoors. The process consists of assembling the cabinets with nails and adhesives. The adhesive is applied manually with a brush. If sanding or cutting of the cabinet is required, it is conducted with hand tools only. After the cabinets are assembled, they may be finished with a stain. The stain is applied with high volume low pressure spray gun.

Step #1 - Identify sources of air emissions

Adhesive: Based on the MSDS; Adhesive Density = 11.43 lb/gal, VOC content = 20 wt%

Stain: Based on the MSDS; Stain Density = 7.56 lb/gal, VOC content = 7.07 lb/gal, Solids content = 1.95 wt%

Hand saws and sanders

Step #2 - Review the construction permit source exempt list

Go to www.scdhec.gov/environment/baq/Permitting/exempt_sources.asp and obtain the latest air permitting exemptions list. This list is periodically updated so it is important to use the latest version.

Adhesive: The application of adhesives is not a source specific exemption. Therefore, proceed to the emission-level based exemption.

Stain: The staining is not conducted within a building. Therefore it does not qualify for the surface finishing source-specific exemption. Proceed to the emission level based exemption.

Hand Saws and Sanders: The following wood shop equipment is exempt: hand sanders, hand saws (chain saw, hand drills, etc.), hand distressing tools (chisel, etc.) and equipment used for boring, notching, etc. Since the facility only uses hand saws and sanders, it is exempt.

Step #3 - Calculate the potential to emit

In order to use the emission-level exemption, the potential to emit must be calculated. A material balance will be used to calculate the potential emissions from the adhesive and the stain.

ADHESIVE CALCULATIONS:

MSDS Information: Adhesive Density = 11.43 pounds per gallon (lb/gal), VOC content = 20 weight percent (wt%); no hazardous or toxic air pollutants.

Maximum Potential Adhesive Usage rate based on the maximum number of wood cabinets that can be assembled at this facility = 600 gal/year. The actual number of assembled cabinets is expected to be much lower for at least three years. Use the maximum usage rate in calculations to determine PTE.

Assumptions: Since the adhesive is applied manually with a brush, the transfer efficiency is 100% (from technical document). Therefore, no PM, PM10, or PM2.5 pollutants are emitted.

Since the MSDS provides the density of the adhesive and the VOC content is provided in wt% and the emission level exemption for VOC is in pounds per month (lbs/month), calculate the VOC emissions using the following equation:

$$\text{VOC Emissions} \left(\frac{\text{lbs}}{\text{month}} \right) = \text{Usage Rate} \left(\frac{\text{gal}}{\text{month}} \right) \times \text{Adhesive Density} \left(\frac{\text{lbs}}{\text{gal}} \right) \times \text{VOC Content (wt\%)}$$

$$\text{VOC Emissions} \left(\frac{\text{lbs}}{\text{month}} \right) = \left(\frac{600 \text{ gal}}{\text{year}} \times \frac{1 \text{ year}}{12 \text{ months}} \right) \times \left(\frac{11.43 \text{ lb}}{\text{gal}} \right) \times (0.20)$$

$$\text{VOC Emissions} \left(\frac{\text{lbs}}{\text{month}} \right) = 114.3$$

The emission level exemption for VOC is less than 1000 pounds per month. Since your facility potential to emit for VOC from the adhesive is 114.3 pounds per month, it is exempt.

STAIN CALCULATIONS:

MSDS Information: Stain Density = 7.56 lb/gal, VOC content = 7.07 lb/gal, Solids content = 1.95 wt%; No hazardous or toxic air pollutants.

Maximum Potential Stain Usage rate based on the maximum number of wood cabinets that can be assembled at this facility = 1400 gallons per year (gal/year). The actual number of assembled cabinets is expected to be much lower for at least three years. Use the maximum usage rate in calculations to determine PTE.

Assumptions: Since the stain is applied with a high pressure low volume spray gun, the transfer efficiency for PM, PM10, or PM2.5 is 65% (obtained from manufacture's data).

The PM, PM10, and PM2.5 emissions are assumed to be equal

Since the MSDS provides VOC content in lb/gal, calculate the VOC emissions using the following equation:

$$\text{VOC Emissions} \left(\frac{\text{lbs}}{\text{month}} \right) = \text{Usage Rate} \left(\frac{\text{gal}}{\text{month}} \right) \times \text{VOC Content} \left(\frac{\text{lbs}}{\text{gal}} \right)$$

$$\text{VOC Emissions} \left(\frac{\text{lbs}}{\text{month}} \right) = \left(\frac{1400 \text{ gal}}{\text{year}} \times \frac{1 \text{ year}}{12 \text{ months}} \right) \times \left(\frac{7.07 \text{ lb}}{\text{gal}} \right)$$

$$\text{VOC Emissions} \left(\frac{\text{lbs}}{\text{month}} \right) = 824.8$$

Since the MSDS provides the stain density, the solids content in wt%, and the PM emission level exemption is in pounds per hour, calculate the PM emissions using the following equation:

$$\text{PM Emissions} \left(\frac{\text{lbs}}{\text{hr}} \right) = \text{Usage Rate} \left(\frac{\text{gal}}{\text{hr}} \right) \times \text{Stain Density} \left(\frac{\text{lbs}}{\text{gal}} \right) \times \text{PM Content (wt\%)} \times (1 - \text{Transfer Efficiency})$$

$$\text{PM Emissions} \left(\frac{\text{lbs}}{\text{hr}} \right) = \left(\frac{1400 \text{ gal}}{\text{year}} \times \frac{1 \text{ year}}{8760 \text{ hours}} \right) \times \left(\frac{7.56 \text{ lb}}{\text{gal}} \right) \times (0.0195) \times (1 - 0.65)$$

$$\text{PM Emissions} \left(\frac{\text{lbs}}{\text{hr}} \right) = 0.0082$$

Step #4: The emission-level exemption for VOC is less than 1000 per month and the PM emission-level exemption is less than 1 pound per hour. Since your facility potential to emit for VOC from the adhesive is 824.8 pounds per month and 0.0082 pounds per hour for PM, it is exempt.

After careful review of all facility operations, consultation with facility engineer and parts manufacturers, review of vendor information and MSDS, and reviewing the exempt list, the facility determined an air construction permit was not needed. This information should be kept at your facility site and readily available for review by DHEC personnel.

Appendix C – Useful Links

S.C. Department of Health and Environmental Control Links

- S.C. Department of Health and Environmental Control website
www.scdhec.gov
- Bureau of Air Quality
www.scdhec.gov/environment/baq/
- DHEC's Regions
www.scdhec.gov/environment/behs/regions.htm
- EQC Forms
www.scdhec.gov/environment/admin/htm/eqc_forms.asp
- Air Quality Modeling Guidelines
www.scdhec.gov/environment/baq/docs/modeling/modguide.pdf

External Links

- SIC and NAICS Codes
https://www.osha.gov/pls/imis/sic_manual.html
www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2012
- Federal Employer Identification Number
www.irs.gov/businesses/small/article/0,,id=98350,00.html
- EPA Quality Planning and Standards
www.epa.gov/air/oaqps/index.html
- EPA Technology Transfer Network Clearinghouse for Inventories & Emission Factors
www.epa.gov/air/oaqps/index.html
- EPA Technology Transfer Network AP-42 Emission Factors
www.epa.gov/air/oaqps/index.html
- EPA Technology Transfer Air Toxics Web Site
www.epa.gov/air/oaqps/index.html
- EPA Tanks Emission Estimation Software
www.epa.gov/ttnchie1/software/tanks/
- EPA Applicability Determination Index
www.epa.gov/compliance/monitoring/programs/caa/adi.html
- EPA Federal Register
www.federalregister.gov/agencies/environmental-protection-agency



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